INFANT AUDIOLOGY ASSESSMENT GUIDELINES

I. Background

The Department of Health Services, Children's Medical Services Branch, is implementing the California Newborn Hearing Screening Program (NHSP) in California Children's Services (CCS)-approved hospitals and neonatal intensive care units (NICU). The families of infants born in CCS-approved hospitals will be offered a hearing screening prior to hospital discharge. Infants receiving care in CCS-approved NICU's will have their hearing screened. Infants who either fail to pass an inpatient and/or an outpatient hearing screening or NICU babies who fail to pass the inpatient hearing screening may be referred to you for an infant audiology assessment.

The goal of the NHSP is to have infants with hearing loss identified by three months of age and into early intervention services by six months of age. To aid in this process, the CCS Program has developed a set of guidelines for an Infant Audiology Assessment with input from the CCS Audiology Technical Advisory Committee. The document reflects a consensus recommendation as to the current standards of practice for performing a pediatric diagnostic test battery on children from birth to twelve months of age.

The goals of the guidelines are to assist in your 1) establishment of frequency-specific thresholds in each ear; 2) determination of the type, degree, configuration and site of hearing loss; and 3) selection, fitting and verification of amplification and introduction to intervention options. These are recommended guidelines; professional clinical decisions will determine the order and choice of tests. A complete audiologic assessment and communication with parents about results and options should be expected to occur over several sessions. The CCS Program will authorize the reimbursement of the procedures in this recommended guideline when performed by a CCS-approved Type C Communication Disorders Center (or Level 3 Hearing and Speech Center) for infants eligible for the CCS program.

It is imperative that in the pursuit of early identification of hearing loss and entrance into early intervention services that the rights of infants and families are guaranteed through informed choice, decision-making and consent. Infant and family information should be afforded the same level of confidentiality and security as all other medical information in practice and law. Therefore, it is highly recommended that consent to share information between audiology and other health care and educational providers be obtained.

II. Infant Diagnostic Hearing Evaluation

The diagnostic audiologic evaluation of an infant should include both developmentally appropriate behavioral measures, objective physiologic (ABR, OAE or other) threshold measures using tonal stimuli and a measure of middle ear function.

A. The following is recommended to be performed on ALL infants referred for a diagnostic hearing evaluation:

1. History, to include family history and infant's communication development to-date

2. Otoscopic examination

3. Diagnostic OAE
(Note: may not be able to obtain low frequency emissions due to high noise floor.)

4. ABR Thresholds
Click screening at 25 dBnHL in each ear.

If the child does not pass either 3 or 4 above in both ears, continue with the procedures outlined in Section B.

5. Behavioral testing (if the infant's developmental age is 6 months or older)
If the child is at least 6 months developmental age, and awake and alert, attempts should be made to obtain ear-specific thresholds at 500-4000 Hz.

A child exhibiting responses to click stimuli at 25 dBnHL in each ear AND normal OAEs bilaterally; or normal Visual Reinforcement Audiometry (VRA) responses and normal OAE's in both ears shall be considered a pass.

B. The following testing should be done on those infants who do not pass the procedures identified in A. above.

1. Frequency specific electrophysiologic threshold (ABR or other electrophysiologic measure) using a minimum of one low frequency and one high frequency toneburst stimuli (for example 500 and 3000 Hz) in each ear.

2. Middle ear evaluation. Bone conduction ABR – threshold in each ear to determine the type of hearing loss; or tympanometry using a high frequency probe tone of 660 Hz or greater.

3. Acoustic Reflexes

4. Auditory neuropathy evaluation

   This procedure is recommended when there is:

   - an abnormal ABR with present OAE's; or
   - an absent ABR, regardless of OAE results.

   This should be an ABR click (air conduction) >80 dBnHL, with rarefaction and condensation averaged separately to look for cochlear microphonic.

III. Parent Information

A. Children without a hearing loss

1. Provide the California NHSP "Ages and Stages" brochure

2. Remind parents to watch for development of communication skills and that hearing can be tested at any age

3. If risk indicators for late onset or progressive hearing loss are present, the primary care provider should be alerted as to the need for communication monitoring, as recommended by the Joint Committee on Infant Hearing.

B. Children with hearing loss

1. Discussion of results.

2. Provide parents with NHSP Parent Packet

3. Discuss communication options

4. Discuss audiologic intervention recommendations

5. Discuss early intervention services and referral

6. Make referral within 2 working days to the Early Start Program.

7. Discuss funding and community support services.

8. Discuss medical referral

9. Obtain consent for exchange/release of information

IV. Reports

Coordination of services for infants is strongly recommended and written reports should be sent to the following individuals to support this.

A. Baby's primary care provider/medical home
B. Parent
C. Hearing Coordination Center (Diagnostic Audiologic Evaluation Report)
D. Otologist/Otolaryngologist*
E. Health plan/payor(s)
F. Referral Source
G. Early Intervention Program*
H. County CCS Program
I. Other agencies involved with infant (e.g., Regional Centers, etc.)

(*for infants with a hearing loss)

V. Amplification

As with all portions of the diagnostic evaluation the decision regarding communication options and amplification are to be made by the family with non-biased input from all professionals involved with the infant's care.

The following recommendations are considered essential in the fitting of hearing aids for infants.

A. Following medical clearance, hearing aid evaluation and fitting should be completed as soon as possible, and before six months of age.

B. Estimates of hearing loss and the fitting of amplification should be based on frequency specific evoked potentials and OAE information.

C. A pediatric specific prescriptive formula should be used to set the gain and output of the hearing aids.

D. Hearing aid performance should be verified by real-ear measurements in addition to behavioral measurements.

VI. Recommended Reading

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Sininger, Y.S., Abdala, C., & Cone-Wesson, B. (1997). Auditory threshold sensitivity of the human neonate as measured by the auditory brainstem response. Hearing Research, 104, 27-38.

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